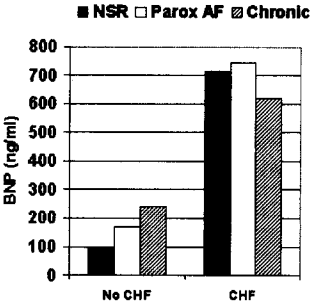
9:36 a.m.

1090MP-124 The Independent Contribution to Elevations in B-Type Natriuretic Peptide From Atrial Fibrillation

Peter A. McCullough, Richard M. Nowak, James McCord, Judd E. Hollander, Evan Loh, Gabriel Steg, Phillippe Duc, Torbjorn Omland, Arne Westheim, William T. Abraham, Alan B. Storrow, Alan H. Wu, Patricia Hlavin, Alan S. Maisel, BNP Multinational Study Investigators, *University of Missouri,Truman Medical Center, Kansas City, Missouri, University of California,Veterans Administration Medical Center, San Diego, California.*

Background. B-type natriuretic peptide (BNP) is known to be released primarily by ventricular myocytes in response to wall tension, and is reliably elevated in patients with congestive heart failure (CHF). Atrial fibrillation (AF) is known to change ventricular filling hemodynamics and is a potential contributor to BNP elevation in patients who present to the emergency department (ED) with acute dyspnea. We sought to determine the effect of atrial fibrillation on the clinical utility of BNP in this setting.
Methods. The BNP Multinational Study was a seven-center, prospective study of 1586 patients who presented to the ED with acute dyspnea and had BNP measured with a point-of-care device upon arrival. Patients were categorized by final diagnosis as CHF, history of CHF but dyspnea due to other causes, and no CHF.
Results. Paroxysmal AF and chronic AF was found in 135 (8.5%) and 124 (7.8%), respectively. Elevations in BNP were attributable to AF in subjects without CHF (figure). Conversely, in acute CHF, AF did not seem to have an additive effect. In subjects without CHF, mean ejection fraction (EF) = 58.2%, there was no correlation between BNP and EF, r = -0.01, p = 0.91. However, in those with CHF, mean EF = 39.3%, BNP was correlated with EF, r = -0.37, p < 0.001.
Conclusion. In patients with dyspnea due to noncardiac causes, AF is related to elevations in BNP, reflecting chronic changes in ventricular filling dynamics and wall tension which are independent of EF.



9:48 a.m.

1090MP-125 Effect of Pulmonary Vein Isolation on Atrial Fibrillation Cycle Length

Mehmet Ozaydin, William Hsu, Hiroshi Tada, Aman Chugh, Christoph Scharf, Radmira Greenstein, Frank Pelosi, Jr., Bradley P. Knight, S. Adam Strickberger, Fred Morady, Hakan Oral, *University of Michigan, Ann Arbor, Michigan.*

Background: Pulmonary veins (PV) can initiate atrial fibrillation (AF). However, it is not clear whether PV's play a role in perpetuation of AF. **Objective:** To determine the effect of PV isolation on AF cycle length (CL). **Methods:** In 7 men and 2 women (mean age=53±11), segmental isolation of PV's was performed for paroxysmal (n=7) or persistent (n=2) AF. A ring catheter was positioned within a PV and a roving catheter was positioned in the left atrium (LA), adjacent to the PV ostium. AF was induced by pacing in 4 patients prior to PV isolation and the remaining 5 patients presented in AF. In 5 patients, 3 PV's (all 4 except right inferior), and in 4 patients, all 4 PV's were isolated. Electrograms (EGM) were recorded from the LA and PV at a sampling frequency of 1 kHz for 20 secs. Only EGM's that were >10% of the max. amplitude and 50 msec apart were analyzed for the mean, median, 25th and 75th percentiles of the AF CL. **Results:** Before PV isolation, AF CL's within the PV and LA did not differ significantly. All 4 parameters of AF CL (mean, median, 25th and 75th percentiles) in the LA became significantly longer after isolation of PV's (Table). All 4 of the parameters of AF CL in the LA and PV before and after the isolation were similar between patients who had spontaneous and induced AF. **Conclusions**: The AF CL becomes significantly longer after isolation of 3-4 PV's, regardless of whether the AF is spontaneous or induced. This indicates that the PV's accelerate AF, thereby possibly promoting its perpetuation.

	Mean CL	Median CL	CL, 25th Percentile	CL, 75th Percentile
Pre-RF PV (msec)	137.6±26.6	141.0±31.4	106.1±30.6	165.4±30.8
Pre-RF LA (msec)	163.5±21.7	170.1±28.2	125.1±30.9	198.6±23.8
Post-RF LA (msec)	217.8±53.9*	217.3±52.0*	205.5±53.9*	264.7±116.1*
P	<0.001	0.001	<0.001	0.01

*: p<0.05 compared to Pre-RF PV and LA

10:00 a.m.

1090MP-126 Is the Left Atrium Arrhythmogenic by Design

Joseph W. Poku, Edward P. Gerstenfeld, Vickas V. Patel, Robert Rho, Sanjay Dixit, Francis E. Marchlinski, *University of Pennsylvania Health System, Philadelphia, Pennsylvania.*

Background: It is largely unknown why paroxysmal atrial fibrillation (PAF) is frequently triggered by pulmonary vein (PV) foci. PV foci may fire more frequently or with shorter coupling intervals. It is also possible that PV ectopy encounters anisotropic tissue in the posterior left atrium (LA) which promotes AF. The purpose of our study was 1) to determine if stimulation from the posterior LA versus RA is more likely to trigger AF. and 2)in selected patients with documented PV discharge resulting in A fib, to determine if rapid pacing from the LA and RA sites promotes AF by the mechanism of PV firing.
Methods: 21 patients (mean age 54+/-13 , mean ejection fraction 59.7%+/-7) with PAF refractory to drugs undergoing PV isolation were enrolled in our study. Rapid atrial pacing was performed at a cycle length of 250ms to 180ms or to 2:1 capture sequentially in the posterior RA and posterior LA. Pacing was performed for 15 beats and followed by a five second pause. The primary endpoint was the reproducible induction of sustained or non-sustained AF. Stimulation was performed while recording from a PV when possible.
Results Of the 21 patients, 7 had no inducible AF from either site. In the remaining 14 patients, PAF was induced from the LA in all 14 (100%) and from the RA in 5/14 (37%, P<. 01). The pacing cycle length at the time of AF initiation was longer for the LA as compared to RA sites in the subset of patients in whom AF was induced from both sites.(224±16.7 ms versus 196± 11.4 ms, mean difference of 28ms, p<0.01)
In none of the patients with arrhythmogenic PV recording was induction of AF preceded by increased PV discharge with RA or LA burst pacing. The closest coupling for repetitive recorded electrograms was always at site of stimulation, consistent with local reentry.
Conclusion: Pacing from LA sites appears to trigger PAF more frequently and at longer cycle lengths than RA sites. Recorded initiation suggests local reentry. These results suggest that the LA may be more arrhythmogenic than the RA independent of PV firing.

10:12 a.m.

1090MP-127 Predictors of Success After Isolation of Pulmonary Veins for Atrial Fibrillation

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Background: The success rate of pulmonary vein (PV) isolation for eliminating atrial fibrillation (AF) has been variable. It is important to identify patients who are most likely to benefit from the procedure.
Objective: To determine the clinical predictors of a successful outcome after isolation of PV's.
Methods: In 52 men and 13 women (mean age ± SD = 53 ± 11 years) with AF (duration = 6.7 ± 6.4 years; 15 ± 12 episodes per month), PV isolation was guided by identification of PV potentials recorded with a decapolar Lasso catheter. AF was paroxysmal in 57, and persistent in 8 patients. All PVs with PV potentials were targeted. Radiofrequency (RF) energy was delivered at the earliest activation sites within 5 mm of the ostium at a maximum temperature of 52°C and a power of 35W for 45 secs. Complete isolation was defined as the elimination of high frequency PV potentials and / or dissociation of electrical activity within a PV from the left atrium. The procedure was repeated in 4 patients due to a recurrence of AF. Predictors of successful outcome were determined by using age, gender, EF, duration, frequency and chronicity of AF, and presence of structural heart disease as independent variables.
Results: During 69 isolation procedures in 65 patients, the left superior, left inferior and right superior PV's were targeted in 52 and all 4 PV's were targeted in 17 cases. Of the 223 targeted PV's, 208 (93%) were completely isolated. In 55 cases (80%) all of the targeted PV's were completely isolated. After 121 ± 78 days of follow-up, AF recurred in 17 of 55 patients (31%) with paroxysmal and 8 of 10 patients (75%) with persistent AF (p<0.01). In addition 8 patients (15%) with paroxysmal and 1 patient (10%) with persistent AF either had improvement or no AF with an antiarrhythmic drug. Among the clinical parameters, only the presence of paroxysmal AF was a predictor of a successful outcome.
Conclusions: After isolation of PV's, 70% of patients with paroxysmal AF have no recurrence. Patients with paroxysmal AF are more likely to benefit from PV isolation than patients with persistent AF.

10:24 a.m.

1090MP-128 Controlled, Randomized Comparison of Right Atrial Pacing Versus Biatrial Pacing for Prevention of Atrial Fibrillation After Cardiac Surgery

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Background: The role of atrial/biatrial pacing for prevention of postoperative atrial fibrillation (AF) is not clear. We tested the efficacy of atrial and biatrial pacing in this setting.
Methods: Consenting pts undergoing heart surgery were randomized into Group 1 (control), Group 2 (right atrial pacing) or Group 3 (biatrial pacing). Pacing (10 beats over sinus rate) with temporary epicardial wires, attached to the left atrium and/or right atrium during surgery, was carried out continuously for four days postoperatively. AF lasting more than ten minutes was considered an occurrence.
Results: A total of 135 pts undergoing cardiac surgery were enrolled in the study. Gen-